REMARKS

Claims 1-44 are pending in the application. Claims 1, 40, 41, and 43 are independent claims. Claims 1-44 stand rejected by the examiner. Assignee traverses the instant claim rejections.

Examiner's Interview

Assignee's representatives would like to thank examiner Sheng-Jen Tsai for the courtesies extended to assignee's representatives (Charles Shorb, Timothy Wilson, Fonda Daniels, John Biernacki, and Brett Squires) during the telephone interview on May 18, 2007. The interview discussed the cited references Daynes (USPN 6,343,339) and Ofer (USPN 6,691,194). The office action's statement on page 7 "Therefore, it would have been obvious for one of ordinary skill in the art at the time of Applicant's invention to recognize that benefits of encapsulation of both lock status data and reader data as a single unit for atomic operations, as demonstrated by Ofer, and to incorporate it into the existing scheme disclosed by Daynes to further [reduce] the pitfalls of deadlock or starvation situations." During the interview, assignee respectfully disagreed that Ofer can be combined with the teachings of Daynes because, *inter alia*, Daynes expressly teaches away from such combination. See Daynes at column 8, lines 37-42. Additionally, Ofer is limited to hardware processors and does not provide for multiple executing entities such as threads. (See Ofer at column 3, lines 27-32.) The interview further discussed Daynes with respect to claim 1 and that claim 1 is directed to handling state, whereas Daynes is directed to changing modes and not states. (See Daynes at column 4 lines 1-4 and the abstract of Daynes.) Assignee respectfully requested that the examiner contact the undersigned attorney at the telephone number listed below, if the examiner is of the opinion that the instant

application is in condition for disposition other than allowance. The remarks and the amendments contained herein further summarize the interview.

Rejections -- 35 U.S.C. § 103

Claims 1-27 and 32-44 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,343,339 to Daynes ("Daynes") in view of U.S. Patent No. 6,691,194 to Ofer ("Ofer"). Claims 28-31 stand rejected under 35 U.S.C. § 103 as being unpatentable over Daynes in view of Ofer further in view of U.S. Patent No. 6,480,918 to McKenney et al. ("McKenney"). These rejections are traversed.

Claim 1 is directed toward a memory for storing a computer-implemented shared locking data store for handling multiple executable entities' access to at least one resource. Claim 1 recites (in combination with its other limitations) encapsulation of both lock status data and the reader data in the shared locking data store allows a hardware atomic operation to operate upon both the lock status data and the reader data as a single unit for determining how access to the resource is to be handled.

The Daynes reference and the Ofer reference (whether viewed alone or in combination) do not disclose, teach or suggest such limitations of claim 1. The Daynes reference defines the locking mode according to how the lock is accessed, for a read operation the locking mode is a read mode and for a write operation the locking mode is a write mode. The Daynes reference then defines the lock state as the set of the values of each of the owners of a the lock. (See Daynes column 8 lines 25-36.) The method and apparatus disclosed by Daynes uses a dedicated bitmap for each locking mode. When read and write locking modes are used, a lock state contains a read bitmap and a write bitmap. (See Daynes column 15 lines 2-5.) The method and

apparatus disclosed by Daynes then uses a lock manager, which maintains an associative Table of Immutable Lock States, and reliance on resources having redundant lock states to decrease memory consumption and processing costs on the system using the method and apparatus. When two resources have the same lock state the method and apparatus disclosed by Daynes will decrease memory consumption and processing costs on the system by using the same read and write bitmaps for both resources. (See Daynes figure 4.) However, if no redundant lock states are present the method and apparatus of Daynes will actually increase the memory consumption and processing costs on the system because read and write bitmaps must be created for every resource, and the system must continue to maintain the Table of Immutable Lock States. Therefore the method and apparatus disclosed by Daynes ties system performance directly to the occurrence of redundant lock states. In contrast and as recited in claim 1, the lock data is encapsulated into a single atomic operation such that memory consumption and processing costs on the system decrease regardless of whether or not redundant lock states are present.

Furthermore, the method and apparatus disclosed in Daynes and which utilize state locks to lock resources is based on tasks, not threads. Tasks can be limited programmatically by the application. This is a requirement of Daynes to appropriately size the lock state tables in the case of the bit-field approach, which would be using the atomic operations to change state. To map this onto threads, the maximum possible threads at any one time becomes problematic as this is greater than the space provided in a single atomic instruction. Further, the method and apparatus disclosed in Daynes and which utilize state locks to lock resources requires the enumeration of the task to be unique, a requirement for the creation and maintenance of the Table of Immutable States. Attempting to map operating threads to a limited number of tasks slots in a unique identifier fashion within the Table of Immutable States space becomes problematic.

With respect to the Ofer reference, the Ofer reference is directed toward a method and apparatus for improving performance in system where multiple processors contend for control of a shared resource. The Ofer reference defines the term shared resource according to a resource's visibility to the multiple processors. (See Ofer column 1 lines 15-25.) Further, Ofer limits access to the shared resource to a single processor. (See Ofer column 3 lines 66-67 and column 4 lines 1-20.) Accordingly the method and apparatus disclosed in Ofer does not allow for multiple executable entities' access to be concurrent with respect to a resource. Claim 44 has been amended herein to further clarify this distinction. Several other of the dependent claims also clarify this distinction. For example, claim 3 describes determination of access to the resource, and claims 8 and 9 respectively describe the rules mechanism associated with allowing both shared access (e.g., any number of read requests) and exclusive access (e.g., only one writer).

Because the cited references do not disclose the limitations of claim 1, assignee respectfully asserts that the rejection be withdrawn and that claim 1 be allowed. Independent claims 40, 41, and 43 recite similar limitations as claim 1. Accordingly, assignee respectfully asserts that the rejections for these claims be withdrawn and that the claims be allowed.

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CONCLUSION

For the foregoing reasons, assignee respectfully submits that the pending claims are allowable. Therefore, the examiner is respectfully requested to pass this case to issue.

Respectfully submitted,

By: _____

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